quickly.

MR. LOWENSTEIN: Our view is -- is not necessarily advocating that you make a change, or not advocating that you make a change, but -- but more to the point of view that a six month to one year delay in PCS is not the end of the world.

I think it's more important that this -- that this market be done right. I think it's important to visit the cellular experience, and recognize that there were errors made in the way the cellular market is rolled out, and the fact that we have no national cellular network right now, and are real patchwork in services, and that one can't use their phone when they travel from Boston to Washington without going through all sorts of complex registration procedures, which consumers are absolutely not going to want to have to go through with their PCS phones.

I think it's important to recognize that those mistakes can't afford to be made again, if the market forecasts that has been made today by all of us in the industry are going to be realized.

MR. HULAK: In terms of the issue of affirming

the current issue or going into recon, although the current poor scheme is not the best, we are aware of the limitations on PCS demand if we continue to get cellular and all the other wireless players time to prepare for it.

So, in an imperfect situation, I guess we would affirm the decision, let the market forces correct. Our forecast reflects the fact that market forces were correct, but that it will lead to confusion, which will limit the short-term out-take PCS.

MR. VAUGHAN: I'm sorry. Your answer is take the year or not take the year?

MR. HULAK: Not take the year.

MR. PEPPER: What happens if it was six months? The question is, what is in fact, what is delay?

MR. HULAK: If we take -- if we say a year to reconsider, and then we'll go to the auction process, then that takes us beyond a year, and the question will become how long will it take to get through the auction process.

MR. PEPPER: I guess the question then is, when do you -- when do you see it important that the auction process begin, and don't say as soon as possible.

MR. HULAK: Delays of a matter of a couple of

months, while creating some of these, and giving the trade press something to write about, I don't think are going to be substantive.

If we're talking delays of more than a year, then we're further undermining the confidence in the market and the ability to re-establish.

MR. PEPPER: So you're saying if we can begin the auction process around the end of the year, that's different than having to begin an auction process in the summer of '95?

MR. HULAK: Psychologically, I think that the impact of the delaying licensing into summer of '95 would be significant.

MR. PEPPER: But, psychologically, beginning at the end of '94, beginning of '95 is significantly different?

MR. HULAK: Pretty much everyone is expecting the licenses to be delayed until the end of '94, and, we, quite frankly, --

MR. PEPPER: What you're saying is that if we start at the end of '94, it's not a delay by definition?

UNIDENTIFIED SPEAKER: It's already at six

.t up.

FIED SPEAKER: We've lost the six

.K: Right. You know, it depends how you
like calling it a deficit, you know.

PER: Mr. Twyver.

:VER: We think that the commission can
the decisions they've been making, have
y with spectrum and the allocations of

lieve a couple technical corrections have
erms of power level, to allow PCS to be
competitor to the user of cellular, and we
:tiquette would have to be corrected. Other
ink it's very good the way it is, and the
the options the better.

PEPPER: I guess one of the questions,
or the general counsel's office is how the
hat those kind of tweaks or minor adjustments
:r a new recon of pleading cycle, whereas, you
adjustments do.

. TWYVER: They were part of the original

proposed rule making, so presumably they could be fixed without recon. I don't know what the legal implications are.

MR. STROUP: I concur that there are technical rules that should be changed. Beyond that, I would suggest affirming the decision, and I would also note the commission consider the incentives of the people that are urging you to take the time.

MR. PEPPER: Mr. Barrett, any questions?

MR. BARRETT: Yes. Mr. Wayland, one of the problems you have is that we -- we were watching this in our offices, and I just ran in there because you had talked about doing this the right way. What do you call the right way?

MR. WAYLAND: I think it's very important that we recognize that the cellular providers today are going to continue to evolve the offerings that they make to the consumer to serve what those evolving needs are.

I've heard a lot of discussion today about cellular carriers having to drop price, and lose customers, and that they would retain a status quo in their offerings, and I don't believe that to be the case.

No one is currently in any bettered position to serve the wireless needs of the customer in their locations than the cellular carriers, but they need to have the opportunity to do that, and to evolve to serve those needs in a fair and equitable way with any others who come into the market place.

MR. BARRETT: Let me ask you this, have you achieved those goals that you just described, or would you be suggesting that we probably -- I think it was in reference to what you asked here maybe a year, two years, whatever it was, and do it the right way, would you have been still suggesting that?

MR. WAYLAND: I'm sorry. Could you ask again --

MR. BARRETT: Is it the configurations you have difficulties with, or is it in-service or out of service problems you have?

MR. WAYLAND: Well, for example, the -- the bandwidth of the allocations, we believe, as I said in -- in my testimony, that 20 mega-hertz represents a very good bandwidth to be provided for all users. We believe that --

MR. BARRETT: Is that in addition to the mega-hertz, the amount that the cellular user is already -- how

many you all have?

MR. WAYLAND: The cellular carriers today have in the order of 25 mega-hertz. However, --

MR. BARRETT: You ought to be able to get one of the 20s and have 45?

MR. WAYLAND: I didn't say that. I do believe that the cellular carriers ought to have the opportunity to be freed up from some of these restrictions on 10 percent and 20 percent ownership, but I do also believe that the best interests of the consumer is served by allowing the best provider to have the opportunity to serve that customer need.

MR. BARRETT: Would they also be better served if they had somebody to compete against the cellular in terms of pricing and quality of service?

MR. WAYLAND: Absolutely. We are very much pro-competitive, and I believe the cellular industry in general is pro-competitive.

MR. BARRETT: And I accept that as your description. Then let me ask you this, you, with your already present 25, would also want an additional 20, and other people would have 20, and you would have 45?

MR. WAYLAND: No. I believe it's important for us to take a look at what we really have right now, Commissioner. We have 25 mega-hertz, as a cellular provider, in selected locations, and the assignments are on the basis of SMAs and RSAs --

MR. BARRETT: I understand.

MR. WAYLAND: Smaller than the BTAs or MTAs. We also have implemented the voice solutions with analog technology, which is what was available at the time.

We are -- we need to evolve to digital technology in order to be able to get anywhere near the kind of capacity that someone could get in even a 10, let alone a 20 mega-hertz new spectrum allocation, which would be implemented as digital to start with.

So looking at those things, I that think we need to free the -- the -- all the players up, to compete for the market segment on the basis of marketing and sales, and technology innovation on an equal footing and an equal basis.

MR. BARRETT: Well, what would be your perception or your description, rather, of an equal basis where we would not have to wait a year, four years, or

whatever?

MR. WAYLAND: Well, I can't address how much time it would take, but I -- I -- I've always underestimated the time it takes to do these things. I would like to think -- MR. BARRETT: So your four years could be two years?

MR. WAYLAND: I would like to think that the commission could take the necessary steps within the next six, plus, maybe 12 months. I'm not in a position to estimate it very specifically, though, in terms of number of months.

MR. BARRETT: Mr. Twyver, you talked about the allocations that we've already made are okay.

MR. TWYVER: Yes.

MR. BARRETT: Under those allocations, why do you think Mr. Wayland wants to change those allocations and --

MR. TWYVER: Well, some of my best customers are cellular operators --

MR. BARRETT: Some of my best friends are, too.

MR. TWYVER: I think that just to be clear here, that cellular operators have a tremendous advantage in

this coming competition. They've got an install base, they've got quite wide coverage, they've made their investments, they didn't have to pay for their spectrum, they got the brand name, the marketing, administrative systems all set up.

There is nothing that we're talking about doing with PCS that can't be done at 800 mega-hertz in a cellular spectrum.

I absolutely believe that the cellular operators will be very aggressive and innovative in the services and the pricing that they bring to the market, and they'll be worthy competition of the new folks.

I think it's even more important, therefore, to make sure that the new entrants have a level playing field, have the spectrum, the 30 meg, and the MTAs that they need to avoid the incumbent microwave users initially, and build up the capacity to match the cellular operators, have the power and the transmitted -- have the transmitters they need to get the same coverage at lower propagation to engage and so on and so forth.

I think the challenge here is going to be to create this level playing field, to allow the new entrants

to overcome the starting advantage that the cellular operators have, in order to get anything like a third or 40 percent of the market that we see happening in the next year.

MR. BARRETT: So you don't see any problems with the present allocation in terms of technical feasibility or other impossibility of -- not impossibility, any disadvantage, if I may, in attracting capital?

MR. TWYVER: No. It's clearly a compromise, but everything is. The 30 meg MTAs --

MR. BARRETT: Our decision was a compromise?

MR. TWYVER: Well, you'll have to talk, sir, but it appeared that it was.

The 30 meg MTAs are attractive enough to attract capital, are big enough to allow current technologies to get a start, and avoid the incumbent microwave users for a period of time, and are big enough to allow businesses to build out broad and diverse services in those MTAs.

So I think the 10 meg chunks are attractive for an innovative new players. They are attractive for low power local services, for wireless local loops, and for data access.

MR. BARRETT: Are the 10s that significant standing alone, only able to aggregate three of the 10s?

MR. TWYVER: I think, as others have said here, market forces --

MR. BARRETT: No, no, no. I'm asking what do you think.

MR. TWYVER: In terms of the technical --

MR. BARRETT: You said they were okay technically and otherwise, and then you also referred to the tri-caper. Would they be that at the four 10s, or remain by themselves, or only if one was usable aggregate three of the 10?

MR. TWYVER: I think aggregation is a powerful market force, and I think --

MR. BARRETT: I understand that. But my question is, whether or not you accept them standing alone, or are they only powerful and attractive if you're -- with the ability to aggregate three of the four 10s?

MR. WAYLAND: They're valuable alone. They're potentially more valuable in some markets with aggregation.

MR. BARRETT: Let me ask you this, if they're

valuable alone, without the ability to aggregate, are there difficulties with manufacturers providing the 20 in the lower band, or the one 10 standing alone?

MR. WAYLAND: Aggregating a 10 with a 20, or 10 with a 30, poses technical challenges that are really cost challenges, that probably won't be met for five years or more.

MR. BARRETT: Do you want to finish, Mr. Wayland, and then I want to ask Tom a question.

MR. WAYLAND: Well, as I said in my written testimony, there are certainly -- the technology issues, and we haven't addressed those very thoroughly this morning, there is another panel to do that.

MR. BARRETT: I do understand that.

MR. WAYLAND: But there certainly is a reason to think that the 10 mega-hertz allocations are substantially disadvantaged as compared to the 30 mega-hertz MBAs, which are at the lower end of the bank.

It's -- I think it's very, very important, though, that we continue to not just be focused upon the specific details of assumptions that lead to projections, and assumptions about --

MR. BARRETT: Tell me, what does that mean, assumptions that lead to projections.

MR. WAYLAND: The assumptions that we use in projecting the market share that one provider or another provider will have in the future.

MR. BARRETT: All right. But that should not be government's role. We shouldn't be involved in whether or not there's demand. We ought to do what we ought to do in terms of allocating in the most reasonable and timely fashion whether this technology will be deployed, and let you determine whether or not there is a market out there. You either make money or you lose your money.

My concern is, under -- under what circumstances can we provide the best allocations that we can bring to the public the kind of services that you all suggest that you can bring, voice video, imaging, or data transmission.

MR. WAYLAND: Yes, sir, and I agree entirely with the statement that you made about leaving those to -- those things to --

MR. BARRETT: I'm not in the market myself, obviously, and I'm not sure, you know, you're speaking --

MR. WAYLAND: But I believe some of the comments

ncerning not delaying have been
bilities to capture immediate market
hat with traditional assumptions of
than looking to the future and what

ommunications, in our view, represents
f services, and not just voice. It's
fferent kinds of applications that
, in different regions and different
ts imaging, its paging. It's the
and we must have sufficient bandwidth in
eople who can do it in order to be able

RETT: Let me ask the question that I
and, that is, that if, in fact, you have
nd one has the ability to aggregate three
ke it a 30, is that 10 capable of
ice data?
usly, it's capable of providing voice, but
f providing video and imaging or data
-- in a quality way?
WAYLAND: Technology has two very, very

important factors. Technologically, one can do that. Assuming that you can clear the bands, you can do that. The cost associated with doing that --

MR. BARRETT: A quality -- a quality transmission can be provided by the 10.

MR. WAYLAND: Yes, absolutely so. The cost of doing that is going to be determined, to a very great extent, on the size of the market that supports the unit cost of the devices that are sold, and that's going to be the fundamental difference between doing there and doing it somewhere else.

If the somewhere else has an attractive feature, such as frequency adjacency and pre-existing technology.

MR. BARRETT: Let me ask one other question, and I've taken too much of your time, Bob. You see no technical difficulties in the aggregation of three of those 10s, and then having that 10 stand alone in terms of quality transmission, be it voice, they are -- obviously, won't have that much problem transmitting voice, but clearly data and imaging may be a different ball game.

You see no technical problems from a manufacture's standpoint?

MR. WAYLAND: I'm not a manufacturer. From the standpoint of a service provider who uses technology, though, I do not see a problem with that, with the critical assumption that the incumbent user, the microwave users, can be timely cleared.

MR. BARRETT: Thank you very much. I'm sorry for all the --

MR. PEPPER: Oh, no, that's okay.

MR. BARRETT: Mr. Wayland, I heard him on the television, and I had to jump up and run in here. Thank you.

MR. PEPPER: Mr. Twyver, you are a manufacturer.

MR. TWYVER: That's right.

MR. PEPPER: Could you comment on Dr. Wayland's last response?

MR. TWYVER: There is no technical problem in providing any of these services at 2100 mega-hertz versus 19.

MR. PEPPER: At what cost and over what period of time?

MR. TWYVER: There is two cost issues. One is, because it's a slightly higher frequency, the technology

is slightly tougher, and propagation is slightly shorter, but the driving factor will always be the volume of production that you produce, that you can get to meet that market, so that's going to be manufacture for any of these applications.

MR. PEPPER: Well, in terms of aggregation which you said you see as a way out of, you know, a box, what happens in terms of product development if, in some markets, you've had the aggregation of three 10s to a 30, as we're talking about, and in other markets it's only two, and in other markets is a 10 stand alone?

MR. TWYVER: That's absolutely no problem. As you know, the cellular spectrum now is divided in half, with a couple of extended chunks. Cellular equipment is agile across those frequencies. I don't see any problem, technical problem at all, in accommodating any combination of 10s, and 20s, and 30s, and that type of thing.

MR. PEPPER: We talked a lot about -- or you talked a lot about the 30s and the 10s. Nobody has mentioned the 20 mega-hertz block in the lower band.

Could you -- somebody address the demand for that, and what you see as occurring with that band, or

with that block, the C block. Mr. Lowenstein or --

MR. LOWENSTEIN: We -- we see that there is some demand, but with the forecast that we have developed for PCS is focused mainly on broad band, on the broad band part of the spectrum and the license spectrum.

Although we see a lot of demand, particularly on some of the surveys we conducted for data and messengering oriented services, some of which will be served by the paging market place --

MR. PEPPER: You're talking about the 900 mega-hertz. I'm talking about the 20 mega-hertz C block, the two 30s. Mr. Hulak?

MR. HULAK: I guess looking at it from a point of view of who will bid on what blocks, there is no doubt that everybody's first priority in a virgin market, and by a virgin market, I mean one where you don't have any wireless interest today, no exclusions applied, everyone is going to go for the A and B blocks, those that decide they're going to bid for it.

The 10 mega-hertz allocations, the existing cellular companies will get them, regardless of whether they're going to turn short-term -- or be short-term

returns or not.

The C block, therefore, would appear to be a default position for some of the larger carriers buying in on a minority share. Realistically, I can see a fragmented picture where in some markets --

MR. PEPPER: Is the 20 at risk of being orphaned, because it's not 30? I mean, what -- in terms of that lower band, in terms of some of the markets you're talking about.

MR. HULAK: Yes. It's not so much that it's because it's not 30, it's because it's surrounded by so much else, you know, other allocations. It creates a very confused environment in the market place.

At some point people are going to have to place their bets as to where they want to go, and we know that the larger players will go to the A and B blocks, the cellulars are simply -- they're going to bid on the -- cellular companies will bid on the 10 mega-hertz.

So, the question is, if everybody gets their wish list, that leaves a very small community of interest for the C block.

MR. PEPPER: I guess the question is, when you

leave the current plan alone, and just to move forward, what do you see happening to that C block? Is it going to be bypassed, there's not going to be competition for it, is it going to receive any capital for build out?

MR. HULAK: Yes and no. In certain markets, yes, it will, it will receive capital, and there will be competition for it. Pretty much if you look at the top MBAs, everyone is eyeing those markets very greedily, so --people in New York and LA and Chicago.

So we would expect that all the allocations would be filled in those types of markets. You go down into some of the smaller markets, I think it could well be bypassed.

MR. PEPPER: Mr. Lowenstein, you had indicated that we should take time to fix, you know, any difficulties or problems that you see in the allocation plan. Was that the kind of thing you were thinking of or are you thinking of --

MR. LOWENSTEIN: No. I misunderstood the question you asked just a moment ago. Now that I'm focused on it, I think actually that, although there will be a lot of emphasis on the A and the B blocks, because

those are the most attractive, I think that there is still significant potential for the C block.

There will be players who would very much like to be part of the PCS game that might not be winners of the A and B block spectrum, but will still have to try to find a way to play, and outside of the top 10 or 20 markets that we are focused on, there are a tremendous demand in many secondary markets, and, as Mr. Wayland had mentioned, there is plenty of potential to offer a very robust service with that amount of spectrum, so we see that -- we see the C block being very active.

What we see is more likely tends to be orphaned, so to speak, would be some of the 10 mega-hertz licenses as stand alones, non-aggregated on parts of the spectrum.

In terms of the comment of, if we need to wait for a few months, or maybe even up to a year to do it properly, I think one of the important points to recognize, in one of our survey data reports, and I think if you really look at some of the results of the PCS trials that have been run by the folks at GTE or Bell Atlantic or Pactel is that the willingness to pay a premium for mobility really comes as some sort of a follow

me service where there are not the kind of islands of coverage that might be limited by CT-2 type service, which is a possibility of one of the types of PCS services that we're seeing.

We see one of the key frustrations among cellular users is the fact that they have areas where they are covered by cellular areas, where they're not, either because of lack of coverage from a geography standpoint, or because of the way cellular licenses are handed out, and there aren't normally frequencies from one cellular region to another.

So we really see that the most important thing to recognize -- among the most important things to recognize with PCS is to not make sure we don't create islands of coverage, because that will be very frustrating, particularly to consumers, and we don't also have just islands of service, and that we also try to focus on the --what would have the greatest potential for creating a general purpose device that would support both voice and data, so we don't have what we call the anti-group, and obviously a mobile device glut, that the average traveller had to carry around a cellular phone, a

pager, a portable computer, an electronic organizer, and a PDA.

We want some sort of a form factor that will perhaps enable an aggregation of devices.

MR. PEPPER: Mr. Vaughan, did you want to --

MR. VAUGHAN: Actually, I wanted to ask a question about rural service, and coming back to Mr. Twyver. Do people view PCS as the best vehicle for providing wireless service to rural communities, or are the economics there for doing that, or is NSS service or some other service a better way of doing it?

MR. TWYVER: Potentially, PC wireless technology could be used in between wired service and better type service where PCS type of solution would reach traditional customers at a lower cost than the other type service. It could be used to completely expand the universality of the basic.

MR. PEPPER: What about the satellite services. We're hearing a lot and reading a lot these days about satellites providing service to low density areas, and you made the point earlier that it's not a demographic, it's the density issue.

MR. TWYVER: Potentially, Dr. Pepper, it extends the material like the original service. Well, the handsets are $3,000, so it depends on which service and what application. There's certainly applications, but you won't see them broadcast on direct tv.

MR. PEPPER: Can you make the statement that 800 mega-hertz cellular is basically throughout all the PCS type of services right now?

MR. TWYVER: It's meeting a lot of the needs here. I think there is a lot of other applications in rural -- rural America.

MR. PEPPER: It's capable, but it's --

MR. TWYVER: I think other applications are being provided by cellular that would be provided by another competitive entry.

MR. PEPPER: Nothing would prevent cellular from providing --

MR. TWYVER: No, I don't think so.

MR. PEPPER: I just have one question for you. In terms of your statistics, if you got perhaps 51, now we're talking below that, would cellular spectrum fully meet the needs and the demands, in your studies, that came